

Thermal degradation kinetics of *Labisia pumila*'s polyphenols

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Abstract

Labisia pumila var. *alata* (LPva) extract contains polyphenolic compounds such as gallic acid, epigallocatechin, protocatechuic acid and rutin that are often consumed to improve women's health. A dry powder form of LPva extract is desired for is desirable owing to its long shelf-life besides easier handling during storage and transportation. Preparation of the dried powder extract involves drying at elevated temperature, which causes degradation of the polyphenolic compound. Thus, it is vital to understand the loss in polyphenolics due to thermal degradation before the mitigating method can be formulated. The thermal degradation kinetics of gallic acid, protocatechuic acid, epigallocatechin, and rutin were investigated at temperatures ranging from 90 to 120 °C and analysed using ultra performance liquid chromatography mass spectroscopy (UPLC). The calculated rate constant (k) were 0.004, 0.0022, 0.1357 and 8.9272 min⁻¹ for gallic acid, protocatechuic acid, rutin and epigallocatechin respectively. Protocatechuic acid showed the lowest degradation rate constant, followed by gallic acid, rutin and epigallocatechin. These results suggest that protocatechuic acid is less prone to thermal degradation compared to gallic acid, rutin and epigallocatechin while epigallocatechin found to be the least heat stable. The results showed protocatechuic acid, gallic acid, rutin and epigallocatechin degradation followed the first-order kinetics model.